CLAIMS LISTING:

1. – 28. (Cancelled)

29. (Currently amended) A method for assessing heating-induced, life-affecting damage to a rotary member that is subjected to cyclical, heat-generating loading, said method comprising:

a) calculating a heating parameter that is based on the thermal diffusivity constant α of the rotary member and the length of time for which the rotary member is subject to a given cycle of heat-generating loading, where $\alpha = \lambda/(\rho * c)$, λ is the thermal conductivity of the rotary member, ρ is the density of the rotary member, and c is the heat capacity of the rotary member;

b) selecting a function and calculating a maximum temperature associated with the rotary member for the given cycle of heat-generating loading using the selected function, wherein ~~the maximum temperature is calculated using~~ one function is selected if the heating parameter is less than a predefined limit value; ~~using~~ wherein another function is selected if the heating parameter is greater than said predefined limit value, said another function intersecting said one function at said predefined limit value; and ~~using~~ wherein either said one function or said another function is selected if the heating parameter is equal to said predefined limit value;

c) repeating steps a) and b) over the course of a multitude of heat-generating loading cycles;

d) tabulating the number of heat-generating loading cycles which have occurred in each of a plurality of pre-defined temperature categories, wherein each of said pre-defined temperature categories corresponds to a range of maximum temperatures that may be generated in association with the rotary member in any given cycle of heat-generating loading; and

e) using the tabulated number of heat-generating loading cycles which have occurred in each of said plurality of pre-defined temperature categories and using pre-established, heating-related life expectancy information for said rotary member, assessing a cumulative amount of heating-induced damage which has occurred to said rotary member using a partial damage theory;

wherein said steps a) through e) are executed automatically on electronic computing means and wherein said method further comprises outputting from said electronic computing means a signal that is indicative of the cumulative amount of heating-induced damage which has occurred to said rotary member.

30. (Currently amended) The method of clam 29, wherein said heating parameter is a Fourier constant Fo, with $Fo = 4*\alpha*t/S^2$, where t is the length of time for which the rotary member is subject to [[a]] <u>the</u> given cycle of heat-generating loading and S is the thickness of the rotary member.

31. (Previously presented) The method of claim 29, wherein the maximum temperature associated with the rotary member calculated in said step b) is a surface temperature of the rotary member.

32. (Previously presented) The method of claim 29, wherein said one function in said step b) is selected from a first set of functions, with a first function in said first set of functions corresponding to loading cycles having a first type of loading profile and with a second function in said first set of functions corresponding to loading cycles having a second type of loading profile, and wherein said another function in said step b) is selected from a second set of functions, with a first function in said second set of functions corresponding to loading cycles having said first type of loading profile and with a second function in said second set of functions corresponding to loading cycles having said second type of loading profile.

33. (Previously presented) The method of claim 29, wherein said one function and said another function are each linear when depicted on a logarithmic-by-logarithmic graph with the logarithm of a heating-related quantity depicted as a function of the logarithm of said heating parameter.

34. (Previously presented) The method of claim 32, wherein each of the functions in said first set of functions and each of the functions in said second set of functions is linear when depicted on a logarithmic-by-logarithmic graph with the logarithm of a heating-related quantity depicted as a function of the logarithm of said heating parameter.

35. (Currently amended) The method of claim 29, wherein the maximum temperature is calculated in said step b) ~~by summing~~ as the sum of a first addend that is a base temperature of the rotary member and a second addend that is a temperature rise associated with the given cycle of heat-generating loading.

36. (Currently amended) The method of claim 35, wherein the selected function is used to calculate the second, temperature rise addend. ~~is calculated using said one function if the heating parameter is less than said predefined limit value, using said another function if the heating parameter is greater than said predefined limit value, and using either said one function or said another function if the heating parameter is equal to said predefined limit value.~~

37. (Previously presented) The method of claim 35, wherein said base temperature is calculated by accounting for cooling of the rotary member between the end of the heat-generating loading cycle that immediately precedes said given heat-generating loading cycle and the beginning of said given heat-generating loading cycle.

38. (Previously presented) The method of claim 29, wherein said rotary member is disk in a clutch or a brake.

39. (Previously presented) The method of claim 29, wherein said rotary member is a gearwheel in a gear train.

40. (Previously presented) The method of claim 29, wherein said signal that is indicative of the cumulative amount of heating-induced damage which has occurred to said rotary member specifies the amount of damage that has occurred to said rotary member.

41. (Previously presented) The method of claim 29, wherein said signal that is indicative of the cumulative amount of heating-induced damage which has occurred to said rotary member specifies the amount of life remaining in said rotary member.

42. (Previously presented) A computer program product comprising program segments which, when run on electronic computing means, execute the following steps:

a) calculating a heating parameter that is based on the thermal diffusivity constant α of the rotary member and the length of time for which the rotary member is subject to a given cycle of heat-generating loading, where $\alpha = \lambda/(\rho*c)$, λ is the thermal conductivity of the rotary member, ρ is the density of the rotary member, and c is the heat capacity of the rotary member;

b) calculating a maximum temperature associated with the rotary member for the given cycle of heat-generating loading, wherein the maximum temperature is calculated using one function if the heating parameter is less than a predefined limit value; using another function if the heating parameter is greater than said predefined limit value, said another function intersecting said one function at said predefined limit value; and using either said one function or said another function if the heating parameter is equal to said predefined limit value;

c) repeating steps a) and b) over the course of a multitude of heat-generating loading cycles;

d) tabulating the number of heat-generating loading cycles which have occurred in each of a plurality of pre-defined temperature categories, wherein each of said pre-defined temperature categories corresponds to a range of maximum temperatures that may be generated in association with the rotary member in any given cycle of heat-generating loading;

e) using the tabulated number of heat-generating loading cycles which have occurred in each of said plurality of pre-defined temperature categories and using pre-established, heating-related life expectancy information for said rotary member, assessing a cumulative amount of heating-induced damage which has occurred to said rotary member using a partial damage theory; and

f) causing a signal to be output that is indicative of the cumulative amount of heating-induced damage which has occurred to said rotary member.

43. (Currently amended) The computer program product of claim 42, wherein said heating parameter is a Fourier constant Fo, with $Fo = 4*\alpha*t/S^2$, where t is the length of time for which the rotary member is subject to [[a]] <u>the</u> given cycle of heat-generating loading and S is the thickness of the rotary member.